U.S. ENVIRONMENTAL PROTECTION AGENCY

RESOURCE CONSERVATION AND RECOVERY ACT
COMPLIANCE EVALUATION INSPECTION REPORT

Facility Name: Georgia-Pacific LLC, Crossett Paper Operations

EPA ID Number: ARD035466648

Inspection Date: April 10-12, 2012

Facility Mailing Address: 100 Mill Supply Road, Crossett, AR 71635

Send Report to: James Cutbirth, Environmental Affairs Manager, Crossett Paper Operations

Facility Description: NAICS code: 322121.

Type of Ownership: ___Federal ___State ___County ___Municipal _X_Private

HW Activities:			
	_X_Gen	___Treatment	_X_Storage (<90d)
	___Storage	___Disposal	___Transporter

Inspect. Type:			
	_X_Lead	___Overview	___Subpart CC
	_X_CEI	___CDI	___Sampling
	___PCE	___Land Ban	___BIF
	___Multi-Media		___Maquiladora

Facility Representatives:

Karen Dickinson, Vice President – Manufacturing
Teresa Walsh, Public Affairs Manager, Consumer Products,
Mark Ruppel, P.E., Manager, Environmental Compliance, GP Consumer Products LP, Little Rock, AR
Jeffrey McCormack, CHMM, Senior Manager, Environmental Management Systems, GP Consumer Products, Atlanta, GA
James Cutbirth, Environmental Affairs Manager, Crossett Paper Operations
Rachel Johnson, Environmental Engineer, Crossett Paper Operations
Sarah Ross, P.E., Environmental Engineer, Crossett Paper Operations
Richard Freeman, Environmental Engineer, Crossett Paper Operations
Glenn McRee, Manager, Pulp Mill Production
Eric Snellgrove, Manager, Utilities & Pulp Operations
Dave Harris, Supervisor, COMP 1
Molly Matthews, Plant Manager, GP Chemicals
Thomas Hudson, Environmental Manager, GP Chemicals

EPA Inspector: Joel Dougherty 214-665-2281

Checklists Completed: (Indicate number attached.)

___Generator	___TSD	___Transporter	___Generator Supplement
___Containers	___Incinerator	___Landfill	___Surface Impoundments
___Tanks	___Land Ban	___Ground Water	___Land Treatment
___Used Oil	___BIF	___Waste Piles	___Thermal Treatment
___Subpart CC	___LOIS	___Closure	___Post Closure
___Subpart BB	___Subpart AA	_X_Photographs	___Chem, Phys, Bio Treat

_X_Attachments (facility documents)

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Reviewed by: Charles A. Barnes, Environmental Engineer Date

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GEORGIA-PACIFIC - NARRATIVE

Introduction

On April 10-12, 2012, the U.S. Environmental Protection Agency (EPA) conducted a Resource Conservation and Recovery Act (RCRA) compliance evaluation inspection (CEI) at the Georgia-Pacific (GP) Pulp & Paper Plant, located in Crossett, Ashley County, Arkansas. The purpose of the inspection was to review the facility's solid waste generation and management practices, with emphasis on compliance with the hazardous waste management regulations. The inspection focused primarily on the management of secondary materials, mainly process wastewater, with an emphasis on hazardous waste determinations, recycling and reuse, and the Land Disposal Restrictions (LDR). I, Joel Dougherty, was the lead inspector.

At about 8:50 AM on Tuesday, April 10, I called Mr. James Cutbirth, to notify him that I would shortly be visiting the GP Crossett Complex and described the nature of the inspection. I provided the advance notice so that he could arrange to have the appropriate plant personnel available for interviews and to provide requested documentation on process and wastewater management.

I arrived at the complex around 10:30 AM. Mr. Cutbirth met me in the visitors' parking lot, and then escorted me to the security office where I signed in and received a visitor's pass and safety instruction card. (I repeated the sign-in process each morning when I arrived at the facility and returned the visitor's pass and signed out at the end of each day.) We then went to a conference room in the Technical Center, where I presented my credentials, and briefly explained the purpose and scope of the visit. We then moved to a conference room in the Administration Building so that I could in-brief Mr. Cutbirth's management and staff, as well as other GP representatives. The following personnel were in attendance (see business cards in Appendix B):

Karen Dickinson, Vice President – Manufacturing, Crossett Paper Operations
Teresa Walsh, Public Affairs Manager, Consumer Products, Crossett Operations
Jeffrey McCormack, CHMM, Senior Manager, Environmental Management Systems, GP Consumer Products, Atlanta, GA
Mark Ruppel, P.E., Manager, Environmental Compliance, GP Consumer Products LP, Little Rock, AR
Eric Snelgrove, Manager, Utilities & Pulp Operations
James Cutbirth, Environmental Affairs Manager, Crossett Paper Operations
Rachel Johnson, Environmental Engineer, Crossett Paper Operations
Sarah Ross, P.E., Environmental Engineer, Crossett Paper Operations
Richard Freeman, Environmental Engineer, Crossett Paper Operations

I presented my credentials and provided a business card to each individual. I informed the group that the Regional Administrator of EPA Region 6, in Dallas, Texas, had received citizens' complaints from Louisiana Environmental Action Network (LEAN), Public Employees for

Environmental Responsibility (PEER), and River Keepers, and that I had been dispatched to review waste management practices pursuant to RCRA, in response to those complaints. I discussed the details of my inspection plan with the group. I also reviewed with them, disclosure and handling by EPA of proprietary information – Confidential Business Information (CBI) – including the photographing of waste management units.

Ms. Dickinson welcomed me to the plant and offered to assist in whatever way was needed. Ms. Dickinson explained that portions of the plant were currently being rebuilt and that several hundred contractors were on site. I learned that Ms. Johnson was the plant's specialist for Clean Water Act issues; that Ms. Ross was the plant's specialist for Clean Air Act issues (Ms. Ross had previously been the solid and hazardous waste specialist.); and that Mr. Freeman was now the plant's specialist for solid and hazardous waste issues.

When we finished the in-briefing, Mr. Cutbirth, his staff, and I, moved back to the conference room in the Technical Center. Mr. Ruppel and Mr. McCormack also joined us. I reviewed a twenty minute safety orientation and successfully tested out.

I asked to be provided first with an overview of the facility and processes, followed by detailed descriptions of the wastewater treatment process and all inputs to the system. I also asked for a site map and diagrams of the wastewater treatment system. As we went through the process descriptions, I asked for hazardous waste determination documentation on secondary materials generated by the processes. Mr. Cutbirth and his staff provided most of the documents that I requested. Some information was not available – it does not exist. Document (records) review is covered in a subsequent section and a list of the documents provided to me by GP is provided at the end of this report. Several documents were declared CBI by the company.

On Wednesday morning, I met with representatives from the Crossett Complex chemical plant – Georgia-Pacific Chemicals: Molly Matthews, Plant Manager and Thomas Hudson, Environmental Manager. I presented my credentials to them and provided my business cards. I also explained the reason for my visit and the nature of the inspection, and reviewed CBI management. I asked Ms. Matthews to provide process flow diagrams and information on inputs to the Crossett Complex wastewater treatment system. The details of that discussion are provided in a subsequent section of this report.

On Wednesday, I also conducted a site tour of the entire wastewater treatment system from the aeration stabilization basin (ASB) back into the headworks of the plant. I also toured the extant landfills, ash basin, and the weak black liquor basin. I did not tour the chemical plant, or any of the mills. The site tour is documented in a subsequent section and in the Photolog.

On Thursday, I completed my document review – covered in a subsequent section – and provided an exit briefing to the management and staff that were present for the in-briefing and two managers from GP's corporate headquarters in Atlanta, Georgia.

All inspection activities are chronicled in the next several sections. Aerial photographs of the facility are provided in Appendix A. Copies of facility documents are provided in Appendix B. Photographic documentation of materials management areas (mainly land units where wastewater and solids are managed) is provided in Appendix C. Documents generated by EPA or retrieved from permit or enforcement documents on file at EPA or the Arkansas Department of Environmental Quality (ADEQ), are provided in Appendix D.

Facility Overview

Georgia-Pacific (GP) operates a large integrated wood, paper, and chemical products complex directly adjacent to the north side of the City of Crossett, Arkansas. The complex is very large; roughly 1.5 mile (east/west) by 1 mile (north/south) in size. The complex includes a log storage & processing mill, plywood plant, stud plant, pulp & paper plant, and a chemical plant. The complex operates 24 hours per day, 7 days per week, 52 weeks per year. (Aerial photographs are provided in Appendix A.)

The Crossett Complex began as a sawmill operation over 100 years ago. The pulp and paper manufacturing plant started in 1937. The construction materials mills are currently idled and GP had to furlough 700 of their 2,000-employee work force. These mills, when operating, produce plywood, framing studs (2x4s & 4x4s), and landscape timbers. The paper operations produce communication paper, bathroom tissue and paper towel, paperboard, and polycoated paperboard. Some of paper products are further processed by other manufacturers to make food and drink containers. The chemical plant produces paper chemicals, thermosetting resins, formaldehyde, and fractionates Tall Oil – the various cuts of which are used in a variety of other chemicals and applications. (Descriptions of these various processes will be described in following sections and are also provided as excerpts from the Clean Water Act (CWA) National Pollutant Discharge Elimination System (NPDES) permit and the Clean Air Act (CAA) Title V permit, in Appendix D.)

The plants in the Crossett Complex share one process wastewater treatment system which eventually outfalls to the Ouachita River, several miles downstream of the plant. (See the labeled aerial photographs in Appendix A. A schematic of this system is shown in Appendix D.) The Crossett Complex operations generate 40 million gallons of process wastewater per day. The system also manages the City of Crossett's municipal wastewater stream.

The Crossett Complex operates under Clean Air Act (CAA) Title V permit. Excerpts from the permit with a listing of process units are provided in Appendix D.

The pulp and paper operation was last inspected by ADEQ's RCRA program in July 2009. The inspection report is included in Appendix D. The relatively minor areas of concern identified during the inspection were resolved without formal enforcement. In late 2011 and early 2012, the plant was inspected by ADEQ's CAA and CWA programs, respectively. These reports (as well as permit information) are available at ADEQ's website:

http://www.adeq.state.ar.us/compsvs/webmaster/databases.htm

Operations/Processes

Kraft Paper Process

Mr. Cutbirth explained the Crossett pulp and paper operations to me. (A generic description of the Kraft process is provided in Appendix D, along with a more specific detailed narrative for the complex, excerpted from the CWA permit.) The reader is also advised to visit EPA's website for additional information on the pulp and paper industry processes. Please visit the following sites to view two publications specific to the industry: *Profile of the Pulp and Paper Industry*; *Kraft Pulp Mill Compliance Assessment Guide*. Excerpts from these documents are provided in Appendix D. Here are the websites:

http://www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/pulppasn.pdf

http://www.epa.gov/compliance/resources/publications/assistance/sectors/kraftpulp.pdf

Both hardwood and softwood trees are brought to the facility for paper manufacture. The plant uses about 65% hardwoods and 35% softwoods. (It takes about 8,000 tons of wood to produce 2,000 tons of paper.) The trees are debarked and then sent through a chipper to render chips that are from ½" to ¾" in size. Chips are sent to 13 (7 hardwood and 6 softwood) digesters for batch processing – approximately 20 tons per batch.

The chips are mixed with "white liquor" (mainly a mixture of sodium hydroxide and sodium sulfide) and high pressure steam, and are cooked for 20 minutes. The harsh chemicals (high pH and reducing environment) and physical conditions degrade the complex lignin structure of wood and liberate cellulose fibers. When the cooking process is finished, the chips are released from the reactors, flowing into "blow lines" that lead to "blow tanks". The blow tanks are at atmospheric pressure so that when the chips enter the blow tanks, they literally blow apart, liberating the pulp, while the water and spent cooking chemicals flash off.

Non-condensable gases (NCG), water, and spent cooking liquor are all recovered. NCGs are sent to the CAA-permitted incinerator for destruction. Water is sent to strippers and the condensate (clean water) is used for washing activities in the plant. This facility is also permitted to incinerate foul condensate overhead from the strippers, pursuant to their CAA Title V permit. Therefore, this material enjoys an exclusion from the definition of solid waste, pursuant to RCRA. (See Title 40 Code of Federal Regulations, Section 261.4(a)(15).) Spent liquor is stored in weak black liquor tanks for reclamation/recycle. Unreacted chips (such as knots) are removed from the pulp. The fiber (pulp) is washed and stored until needed for further processing.

The pulp is further processed by bleaching. This removes color and further degrades the lignin. The bleach process at this facility uses a multi-stage process with alternating reactions incorporating chlorine dioxide, caustic soda, oxygen, acid, and hydrogen peroxide. Bleached pulp is spread onto a continuously moving wire screen which allows the water to drain away, forming a sheet of paper, board, or tissue, depending on the type of machine. Vacuum and heat augment the drying process. The plant currently operates 8 machines: 1 fine (communication paper); 2 board (food grade container stock); 5 tissue. Sheet paper is dried, pressed, smoothed, coated (if appropriate to the application), and rolled.

The recovered spent chemical reactants from pulping are termed "weak black liquor". Spent black liquor that is reclaimed enjoys an exclusion, pursuant to RCRA, from the definition of solid waste. (See Title 40 Code of Federal Regulations, Section 261.4(a)(6).) In order to enjoy the exclusion, the material may not be accumulated speculatively, meaning that at least 75% of the material must be recovered every calendar year. (See Title 40 Code of Federal Regulations, Section 261.1(c)(8).) GP recovers over 90% of the weak black liquor produced (see Records Review section).

Weak black liquor, a liquid solution containing 14% solids, is evaporated to a semi-solid containing 75% solids. This material (about 4.6 million pounds per day) is burned in the plant's recovery boiler/furnace. The furnace obtains BTU from the carbonaceous materials liberated from the wood which are entrained in the black liquor – the inorganic materials exit the bottom of the furnace as a molten lava-like material called smelt.

The smelt is reconstituted to "green liquor" using wash water to re-dissolve the recovered chemicals. Impurities or insoluble materials are filtered out as green liquor dregs, mainly unburned carbon (char), calcium carbonate, and iron compounds. The green liquor is further "fortified" with lime to produce "white liquor", the main reactant in the digestion process. Undissolved lime and other insoluble materials settle out as slaker grits. Calcium carbonate from the white liquor clarification is sent to a kiln for calcination and reuse in the cycle. (A block diagram of the generic process is provided in Appendix D.)

The liquor recovery operations, including the lime mud calcination, comprise a major part of the overall paper manufacturing process. Capture and recovery of the materials is cost effective and conserves raw materials. The plant utilizes two large weak black liquor storage tanks and a large (30 million gallon) weak black liquor storage basin to store this material prior to recycle. The plant treats both the black liquor and lime mud as valuable commodities. The process areas are designed to capture any spilled/leaked materials and route them back into the processes.

The Crossett Complex processes use over 40 million gallons of water per day. The plant draws its water from the Saline River via Georgia-Pacific Lake, northeast of the plant. Utilities Operations treats the water to meet various utilization standards, particularly for conversion to steam, use in cooling towers, scrubber systems, chemical make-up, and washing. The facility uses several boilers. Depending on the use and CAA permit requirements of each unit, the plant may use woodwaste, shredded tires (tire derived fuel or TDF), refuse (RDF), agricultural derived fuel (ADF), NCGs, sludge, used oil, or natural gas as fuel.

GP Chemicals Process

Ms. Matthews explained the details of the GP Chemicals processes and provided me with block flow diagrams which outlined the processes and showed the inputs to the Crossett Complex wastewater treatment system. During the inspection, Ms. Matthews asserted a claim of CBI for these documents. However, Ms. Matthews later withdrew that assertion, in a letter to me dated May 11, 2012. (See Appendix B.) [Note: Mr. Cutbirth also described processes at this site as part of the process overview the previous day.] Documents excerpted from the CAA and CWA permits also provide process and unit overview. (See Appendix D.) Process wastewater generated by GP Chemicals is treated in the GP Complex wastewater treatment system (see next section).

The chemical plant manufactures glues and resins, and fractionates Tall Oil. One of the first steps in the manufacture of resins and glue is the catalytic generation of formaldehyde from methanol and absorption in water to form a 50% formaldehyde solution. The formaldehyde is then polymerized with either urea or phenol to manufacture urea-formaldehyde (UF) or phenol-formaldehyde (PF) resins, respectively. UF resins are used in the production of particle board. PF resins are used in a variety of manufacturing processes (coatings, adhesives, epoxy curing agents) including plywood/laminate manufacture. Epichlorohydrin can be added to produce wet-strength resins. These processes generate process wastewater which is sent to the GP Complex sewer system. Gases stripped from wastewater and tank vents are sent to the CAA-permitted incinerator for destruction.

This plant also operates a Tall Oil fractionation unit. Tall Oil is derived from the liquor reclamation cycle of the Kraft paper process. The high alkalinity and temperature of the Kraft process converts the esters and carboxylic acids in pine resins into soluble sodium soaps of lignin, rosin, and fatty acids. During the liquor recycle process, the soaps floatate and are skimmed off and collected. The soaps are further processed by heating and acidulation with sulfuric acid to produce “Crude Tall Oil” (CTO). The chemical plant purchases CTO for fractionating. [Note: The GP paper operation burns tall oil in the recovery furnace and does not supply this material to GP Chemicals.] GP Chemicals sells the various cuts from the fractionation process to other companies for further processing. Side cuts and overheads from CTO distillation can be used for a multitude of products including soaps, perfumes, medicines, lubricants, emulsifiers, tacifiers, binders, adhesives, gums, glues, and printing ink. Bottoms from CTO fractionation can be used for energy recovery. Condensate from the processing of Tall Oil is sent to the GP Complex sewer system.

Wastewater & Stormwater Sewer System

Process wastewater from pulp/paper manufacturing that cannot be recycled (the plant recovers 75% of steam condensate) eventually finds its way into one of three process wastewater sewers. The process wastewater sewers are designated/labeled P1, P2, and P3. (See sewer diagrams and Stormwater Drainage Map (CBI) in Appendix B.) Source inputs to these units will be described in the following paragraphs and sections. The sewers form the "headworks" of the wastewater treatment system in the production plant site, and also act as conveyances to downstream treatment units. All three sewers have open or earthen areas, where they are not enclosed by sump or pipe. Open sewers, those units not totally enclosed or conveyed by pipe, are considered land units pursuant to RCRA – surface impoundments. Therefore, GP must make hazardous waste determinations on each wastewater stream discharged to a land unit.

Various treatment stages/units consist of ash settlement, primary clarification, surge protection, and aggressive biological treatment (nutrient supplementation and aeration). These units are located between 1.5 and 3.5 miles southwest of the plant. (See aerial photographs in Appendix A. Aerials #1-3 provide an overview of the entire system; Aerials #4-10 & 17 are unit-by-unit presentations.) Final discharge is to the Ouachita River, some 10 miles southwest of the complex. [Note: Stormwater from non-process areas is handled by two separate stormwater conveyances which bypass the wastewater treatment system. Stormwater from process areas is managed in the process sewers.]

Each process sewer services a different set of processes in the plant, depending on the characteristics of each wastewater stream. The inputs to each sewer will be described in more detail in a later section. The following paragraphs present an overview of the entire system.

The P1 Sewer services the digesters, the high density pulp stock towers, the alkaline stages of the bleach plant, the fine paper machines, the board mill, the "N/S Broke Closets", the "Cow Pen", and the U-Drain. [Note: Several times in this report, references will be made to units which have peculiar names; *e.g.*, Cow Pen, COMP 1. GP representatives that I talked to, do not know how these units came to be named. They were named long ago, but now no one remembers the reason for the names.] Much of the P1 Sewer is hidden from view in underground concrete piping within the production process areas. However, various discharges to P1 emerge at several points and the main channel flows through the southern third of the Pulp & Paper Mill in an open, earthen ditch, clearly visible in the aerials.

The P2 Sewer services the woodyard (stormwater), repulped hardwood #1 & #2 tissue pulp storage, tissue machines #4-8, liquor recovery operations, GP 2 & 3 pulp Mill Washers, "COMP 1", lime kiln scrubber underflow, potential process upsets (an extremely rare event) from lime mud slurry operations, washed green liquor dregs, and leachate from the North and East Landfills. Most of this sewer is hidden from view in underground concrete pipes. A small segment is visible along the southern boundary of the woodyard (chip piles). P2 combines with P1 just west of the plant (see below).

The P3 Sewer services mainly the utilities plants: water treatment wastes, boiler blowdown and ash, and cooling tower blowdown. The stream carries two types of boiler ash – heavy and light. Heavy ash settles out almost immediately in the Ash Pond located at the headworks of the system, whereas the light ash becomes entrained in the wastewater stream and is carried downstream to the West and East [Ash] Settling Basins. The P3 Sewer also services the Plywood Mill (currently idled) and the Chemical Plant. The Bleach Plant Acid Sewer also discharges to P3. P3 is an open, earthen conveyance for almost all of its length. The beginning (headworks) segments and main channel, flowing through the southern third of the Pulp & Paper Mill parallel to P1, are clearly visible on the aerials.

Wastewater effluent from the Chemical Plant also discharges to P3. Stormwater from process areas, cooling tower blowdown, boiler blowdown, water treatment residues, process wastewater, and cleaning waste all contribute to the Chemical Plant effluent. Water on the Chemical Plant site is routed in a metal-grate-covered, concrete "trench system". Water that is contaminated with oily secondary materials is first routed through an American Petroleum Institute (API) Separator prior to discharging the underflow to the system. Wastewater is collected in "Containment Area 1" (also shown on the Stormwater Drainage Map as the "Chemical Pond"). This unit is a surface impoundment located just east of the [Heavy] Ash Pond (see Aerial #17). The unit functions as a "wide spot in the line" or surge pond, prior to discharging wastewater to the P3 Sewer.

P2 combines with P1, just west of the facility boundary. Stormwater from northwest process areas of the complex enter P1 just west of this point. Then, the P1/P2 combined stream and P3 sewers enter separate underground pipes. The sewers emerge less than a quarter mile from the Primary Clarifier, and again flow through open conveyances. The P1/P2 combined stream enters the Primary Clarifier, which removes suspended solids – mainly fiber lost from production processes. The P3 stream bypasses the Primary Clarifier, picks up the treated P1/P2 stream from the Primary Clarifier, and then the P1/P2/P3 combined stream enters either the West or East [Ash] Settling Basin where the entrained ash is removed.

The stream then enters a Surge Basin. From the Surge Basin, the wastewater is transported by open conveyance to the Aeration Stabilization Basin (ASB). The conveyance to the ASB also picks up effluent from the City of Crossett wastewater lagoon. The wastewater is supplemented with nitrogen, phosphorous, and bacteria prior to entering the ASB. The ASB provides aeration through 78, 50-horsepower aerators located in the first stages of the ASB. Treated water discharged from the ASB is routed to a "finishing pond", Mossy Lake, several miles away. Mossy Lake discharges to Coffee Creek, which outfalls to the Ouachita River under CWA NPDES Permit.

[Note: Stormwater conveyances (a north and a south conveyance) transport stormwater runoff from non-process areas of the Complex directly to Mossy Lake. The conveyances bypass the wastewater treatment system. Stormwater runoff from process areas of the complex are routed, via the appropriate sewers, into the wastewater treatment system.]

Secondary Materials Management/Hazardous Waste Determinations

Paper Operations

As noted previously, GP must make RCRA hazardous waste determinations on each wastewater stream discharged to a land unit. Neither the CAA nor the CWA Permits require sampling for all RCRA hazardous waste characteristics. The CWA Permit does require sampling for some RCRA chlorinated volatile organic analytes (VOA). The CAA Permit sets *emissions* limits for some VOAs that are also RCRA constituents, particularly at the ASB, and for metals, for instance on the recovery boiler. (See Appendix D for a crosswalk table of CAA and CWA constituents that are also of RCRA concern.)

In this regard I asked Mr. Cutbirth and his staff to describe how RCRA hazardous waste determinations were made. GP relies heavily on knowledge of the production processes – knowledge of process (KOP) – to determine the characteristics of the various wastewater streams generated. (This is an entirely acceptable method by which to make hazardous waste determinations, as long as the facility can provide documentation to back its claims.) As an additional basis and documentation for that knowledge, Ms. Ross stated that numerous technical bulletins are available from the National Council for Air & Stream Improvement, Inc. (NCASI) which describe the types of constituents that might be found in the various wastewater streams generated at a typical pulp and paper plant. Ms. Ross explained that because the GP Crossett paper operations do not deviate from the typical operations found at most plants, it is possible for GP Crossett to use these guidance documents with a high degree of confidence.

[Note: NCASI is an independent, non-profit research institute that focuses on environmental topics of interest to the forest products industry. Membership is open to companies that manufacture pulp, paper, or solid wood products, or who manage industrial timberlands.]

GP does conduct internal sampling (inside the plant boundaries) for CWA compliance and for process monitoring. There are three internal CWA outfalls and 14 internal process monitoring sampling points. The internal outfalls are: 101 – Line 1A of Hardwood Effluent; 102 – Line 1B of Hardwood Effluent; 103 – Line 2 of Softwood Effluent. RCRA constituents monitored are: 2,4,5-Trichlorophenol; 2,4,6-Trichlorophenol; Pentachlorophenol; Chloroform. The 14 process monitoring sampling points are: Fine Paper; Board Mill; #4 & 5 Tissue; #6 & 7 Tissue; #8A Tissue; #8B Tissue; Cow Pen; GP III; U-Drain; Main 2; COMP 1; P1; P2: P3. The only RCRA analysis performed at these stations is for corrosivity – pH.

Mr. Cutbirth stated that the CWA internal outfalls are located in the production areas near the bleach plant. Ms. Johnson marked the 14 internal process monitoring sampling points on the Stormwater Drainage Map. Some of these stations are located within the production areas where the sewer lines are underground. Other stations are located at, or just upstream from, the above-ground discharge locations. The P1, P2, and P3, sampling points are located at the western boundary of the plant (see Photographs #50-52). The Fine Paper and U-Drain locations are shown in Photographs #29-32. The Board Mill/Cow Pen location is shown in Photograph #33. The GP III sampling point is shown in Photograph #35. The sampling point for Main 2 is located just prior to the discharge to P1. COMP 1 is located up stream of the location in Photograph #34 (and prior to joining the GP III stream underground). The four tissue machine sampling locations are all located upstream of the P2 outfall to P1.

Ms. Johnson provided me with a print-screen copy of the sewer schematic from the plant's data management system (Appendix B). We used the diagram for visual aid as Mr. Cutbirth and his staff described processes and sewer inputs. The following paragraphs summarize these inputs and GP's hazardous waste determinations for their wastewater streams.

The P1 servicing areas would contribute mainly total suspended solids (TSS) in the form of lost [cellulose] fiber (fine paper machines, board mill, high density pulp stock towers). The bleached white fiber suspended in these waste streams gives rise to the term "white water". The board mill would also contribute materials from coating operations such as latex binders and clay. Material Safety Data Sheets (MSDS) for these materials indicate that they are not hazardous when disposed. The digesters would contribute washed knots and steam condensate. The Cow Pen would contribute "runout" – chunks too large for the digesters. The U-Drain would contribute similar materials – pieces that did not "work up" and blow out. [Note: Mr. Cutbirth stated that the water in all of these waste streams carries negligible amounts of the original reactants of the pulping process since the materials are washed to recovery pulping chemicals.] The Bleach Plant effluent to P1 is from the alkaline stage. Mr. Cutbirth stated that the bleaching reaction is run to extinction in order to eliminate, or severely limit, the potential to form chlorinated organic constituents. GP monitors the bleach plant streams for several RCRA chlorinated organic constituents as part of their CWA Permit requirements.

The P2 servicing areas would contribute mainly water lost from the tissue machines (white water) and water from the last fiber washing cycles (GP II & GPIII), after the pulping chemicals have been recovered. The GP washers would contain small amounts of the pulping liquor, although the concentrated chemicals have been recovered prior to this step. COMP 1 contributes condensate from the evaporators. This sewer also receives Lime Kiln scrubber underflow. This sewer also has the potential to receive process upset and/or wash down from pulp storage and repulping activities, and lime slurry overflow. Double-washed dregs are discharged to this sewer. P2 also receives leachate from the North and East Landfills.

I asked Mr. Cutbirth about the concentration of sulfide (a major constituent of pulping liquor) in the sewer water. Mr. Cutbirth stated that GP did not conduct any internal monitoring for sulfides. Monitoring is conducted at the outfall for the ASB and concentrations average about 0.08 milligrams/Liter. Mr. Cutbirth further stated that if entrained sulfides were an issue, the plant hydrogen sulfide (H_2S) monitors would be activated and that they had never gone off during his tenure.

The P3 servicing areas would contribute treatment residues, or backflush, from water treatment, boiler blowdown, cooling tower blowdown (no chromium-containing inhibitors are used), wet scrubber underflows, and heavy and light ash. Boiler maintenance activities would also contribute materials. The Bleach Plant contributes an acid discharge to this sewer. (The potential to produce chlorinated organic constituents was discussed in the preceding the summary of the P1 system.) The Plywood Mill would normally contribute additional ash and boiler residues to this system, but it is currently idled. P3 also receives the Chemical Plant discharge (see next sub-section).

Ms. Johnson provided analytical data for the CWA-monitored chlorinated organic constituents. (See Records Review section and Appendix B.) The concentrations of chloroform, trichlorophenols, and pentachlorophenol (PCP), are all below RCRA regulatory levels. Most constituents are present in part per billion (microgram per litter) concentrations, whereas regulatory limits are from a few hundred to thousands of parts per billion. [Note: GP does not use PCP as a biocide.]

I reviewed daily monitoring records for the month of January 2012 for the 14 internal process monitoring stations (See Records Review section). The pH did not exceed 12.5 Standard Units (S.U.), the regulatory cutoff for RCRA, at any of the stations. The highest readings were observed for the Cow Pen (~10 S.U.), GP III (~10 S.U.), and COMP 1 (~10.5-11.0 S.U.). The highest reading I observed was 12.2 S.U., for COMP 1, on January 12, 2012. Readings for P2, overall, were about 10-10.5 S.U.. The pH readings at the other stations were usually between 7 and 8 S.U.. Mr. Cutbirth stated that the pH of the acid sewer runs between 3.5 and 4.0 S.U.; however, I was not provided with analytical documentation.

After the inspection, I contacted Mr. Cutbirth to discuss other sampling and analytical data that may have been conducted, but not provided to me. Mr. Cutbirth was joined by Mr. Mayes Starke, an internal wastewater consultant, who informed me that GP had just recently conducted sampling for additional VOAs as part of a CAA Title V NCASI open-ditch modeling project. Mr. Cutbirth provided the results to me and they can be reviewed in Appendix B. The details of the analyses and results are presented in the Records Review section. All RCRA constituents were present in concentrations that were hundreds of times below regulatory limits.

Chemical Plant

Ms. Matthews described the various process wastewaters that enter the GP Chemical Plant wastewater system (and subsequently P3), and the KOP and/or analytical information used to make hazardous waste determinations. The following paragraphs summarize GP Chemical's hazardous waste determinations for inputs to their wastewater stream. (Mr. Cutbirth also provided information concerning GP Chemical Plant's wastewater characteristics.) Except for neutralization of potentially corrosive kettle (reactor vessel) wash-out and oil/water separation for CTO processes, GP Chemical does not treat their wastewater prior to discharging to P3.

Wastewater is generated from boiler blowdown, cooling tower blowdown, stormwater from process areas, and water generated from the actual processes – distillates, reactor vessel wash-out, vacuum sumps, containment area spills/leaks – and truck and rail car wash-out. GP Chemical relies on both analytical data and KOP for hazardous waste determinations. After the inspection, Ms. Matthews provided me with a spreadsheet which summarizes hazardous waste determinations for the various waste streams. Ms. Matthews also provided me with analytical data for API underflow and vacuum pit water from CTO processing.

The spreadsheet of hazardous waste determinations is fairly detailed, so it will not be reiterated here. (Please see Appendix B.) By way of summary, GP Chemical first determines whether or not a material might be a listed waste. Spills, leaks, overflows of unused chemical products such as phenol, methanol, or formaldehyde would be U-listed wastes if disposed. [Note: Methanol is listed only for ignitability.] The product tanks have concrete secondary containment structures. GP Chemical recovers spilled product whenever possible. If it is not possible to recover the materials, they are managed as hazardous wastes and are not disposed to the wastewater system. If a secondary material is not a listed waste, GP Chemical uses KOP to determine whether or not the material would exhibit a hazardous characteristic. GP Chemical has also used sampling and analytical data to make such determinations.

Constituents that can be found in the GP Chemical Plant effluent include: methanol, formaldehyde, phenol, benzene, toluene, methyl ethyl ketone, acetaldehyde, cyclopentanone, cresols, chromium, and ammonia. [Note: GP Chemical has determined that the formaldehyde and phenol do not arise from dilution of U-listed wastes.] All RCRA constituents of concern were detected at concentrations below regulatory limits. I did not see, in the information provided to me, any obvious indication of RCRA hazardous wastes being discharged to Containment Area 1 (which ultimately discharges to P3).

Non-wastewater Secondary Materials

The black liquor recovery cycle was discussed previously. The pulping chemicals are recovered in this process. However, the recovery process does generate two by-products that are managed as solid waste: green liquor dregs and slaker grits. The smelt is reconstituted to "green liquor" using wash water to re-dissolve the recovered chemicals. Insoluble materials are filtered out as green liquor dregs, mainly unburned carbon, calcium carbonate, and iron compounds. The green liquor is further "fortified" with lime to produce "white liquor". Undissolved lime and other insoluble materials settle out as slaker grits. The dregs and grits are double-washed to recover the pulping chemicals. The dregs are then sewered to settle out in the clarifier. The grits are dewatered and then disposed in the North Landfill. GP has determined, by KOP, that these materials would be non-hazardous. No analytical data were available for review.

The recovery boiler uses Electrostatic Precipitation (ESP) to recover fly ash and particulate emissions. Rappers in the ESP knock the particulates into a “wet box” and the materials are recovered to the black liquor. Foul condensate from the digestion process is incinerated.

Two types of boiler ash are generated: heavy ash, which settles out at the Ash Pond and fly, or light ash, which settles out in the West and East Settling Basins. Heavy ash is disposed in the North Landfill. Light ash is used as fill for the Reclamation Area. GP has sampled and analyzed these materials, by the Toxicity Characteristic Leaching Procedure (TCLP), for metals. All metals were below regulatory limits. (See Appendix B.)

Sludge from the Primary Clarifier is dewatered and disposed in the North Landfill. GP has sampled and analyzed this material, by TCLP, for metals. All metals were below regulatory limits. (See Appendix B.)

GP generates used oil from various maintenance activities – approximately 10,000 pounds per month. GP uses this material, along with used oil purchased from off site, as fuel for the boilers. GP has made the determination that the material is suitable for use as a fuel. The material meets the regulatory requirements for used oil fuel. The analytical data are provided in Appendix B and discussed in the section on Records Review. Used oil is stored in a 3,000-gallon tank until tested, and then it is mixed with used oil purchased from off-site vendors in a 576,000-gallon fuel storage tank.

GP operates two solid waste landfills: North Landfill and East Landfill. (The West Landfill is closed.) The units operate under separate permits from ADEQ. Hazardous waste disposal is not permitted at either unit. (GP Chemicals also uses these units.) Both units have leachate collection basins and leachate is pumped via pipeline to the P2 Sewer. [Note: GP describes “leachate” as any stormwater that comes into contact with the waste in the unit – be it through runoff or percolation.]

The North Landfill is a 250-acre facility located about 1.5 miles north of the GP Complex. (See Aerials #26-27.) It is permitted to receive trash, paper products, wood debris, lime kiln dust, slaker grits, green liquor dregs, dewatered sludge, and boiler heavies (ash & slag). All materials must pass the paint filter test prior to interment. This unit has a ground water monitoring system (see Records Review section).

The East Landfill is a 67-acre facility located within the GP boundaries on the far northern border of the Complex. (See Aerial #25.) It is permitted to receive soil-contaminated wood waste that is not suitable for fuel, or construction debris such as concrete, asphalt, or bricks.

Site Tour

On Wednesday morning, after the interview with GP Chemical representatives, we toured the landfills, wastewater treatment system, and land units within the plant site, proper. We also visited the black liquor recovery and lime mud operations, as well as the slaker grits and green liquor dregs management area. Mr. Cutbirth escorted me throughout the entire tour. Mr. Rupple was also present for the entire tour. Ms. Johnson was present for most of the tour, but had to leave to attend a meeting, mid afternoon, after we visited the black liquor recovery area. We traveled in the company's vehicle to each site, and then exited the vehicle and walked each area in order to more closely view details.

Where possible, I photographed land units where secondary materials were managed, mainly the wastewater treatment processes and the landfills. Mr. Cutbirth took a few photographs where it was more convenient for him to do so, or where proprietary processes might have been revealed in the photographs. Those occasions are noted in the Photolog. The photographs taken during the site tour are presented in Appendix C.

I took the EPA photographs with an Olympus Stylus 720 SW Digital Camera. Original photographs have been archived. Copies of the original photographs were modified (brightness, contrast, cropping), as necessary to provide clear images for inclusion in this report. Any modifications to the copies are noted in the Photolog. Copies of the photographs were also downloaded for Mr. Cutbirth, at the completion of the tour.

We began the tour at the North Landfill. This 250 acre facility is located about 1.5 miles north of the GP Complex. (See Photographs #3-5 & Aerials #26-27.) The unit has a solid waste permit issued by ADEQ (see Appendix D). It is permitted to receive trash, paper products, wood debris, lime kiln dust, slaker grits, green liquor dregs, dewatered sludge, and boiler heavies (ash & slag). All materials must pass the paint filter test prior to interment. Security, at the entrance to the facility, checks the loads and receipts to ensure compliance with the permit requirements.

GP maintains a "Hazardous Waste Exclusion Plan" which describes the operating procedures that must be followed to ensure that RCRA hazardous wastes are not disposed here. GP makes hazardous waste determinations on materials using both knowledge of process (KOP) and sampling and analysis. Hazardous waste determinations for grits and dregs were made by KOP. Hazardous waste determinations for dewatered heavy ash and dewatered sludge were made using the Toxicity Characteristic Leaching Procedure (TCLP). (A copy of the Hazardous Waste Exclusion Plan is provided in Appendix B, along with TCLP results for dewatered heavy ash and dewatered sludge.) The North Landfill has a Ground Water Monitoring System composed of seven monitoring wells. (A recent copy of the Ground Water Monitoring Report is provided in Appendix B.)

When we arrived, I observed heavy equipment and personnel working on the graded slopes of the fill. Some of sloped areas were covered in grass. Only about 25-30% of the entire unit is currently active. There is a small area (~ 4 acres) located near the southwest corner of the unit that is used for soil cover – borrow pit. GP describes "leachate" as any stormwater that comes into contact with the waste in the unit – be it through runoff or percolation. Leachate collects in the low area adjacent to the western slope of the fill and flows towards a pumping station near the southwest corner. The material is pumped back to the GP Complex, combines with leachate from the East Landfill, and enters the P2 Sewer. Analytical data for the leachate are included in the Ground Water Monitoring Report. Tall grasses were growing in the ponded leachate.

The next area visited was the East Landfill. This 67 acre facility is located within the GP boundaries on the far northern border of the Complex. (See Photographs #6-10 & Aerial #25.) This solid waste unit is permitted by ADEQ to receive soil-contaminated wood waste that is not suitable for fuel, or construction debris such as concrete, asphalt, or bricks.

GP maintains a "Hazardous Waste Exclusion Plan" which describes the operating procedures that must be followed to ensure that RCRA hazardous wastes are not disposed here. This unit does not have a ground water monitoring system, but does have a "leachate" collection system. Leachate is collected in a small pond on the northwestern corner of the unit, and is pumped via pipeline to the P2 Sewer after combining with leachate from the North Landfill. There are no analytical data for this material.

When we arrived, I observed several piles of construction debris – asphalt, bricks – that were being stored for potential later use. Wood debris was being pushed off the northern slope of the unit. The entire western slope was covered with grass and flowers. The leachate collection pond was relatively empty and tall grasses were growing in the water.

After visiting the two extant landfills – the Western Landfill is closed and we did not visit that unit – we began the tour of the wastewater treatment system. The major components of the system are located quite some distance from the actual plant, and they are spread over a very large area. Aerials #1-3 provide an easy-to-visualize overview of the main components and their relative locations and size. As shown in Aerial #2, the system stretches several more miles beyond the Aeration Stabilization Basin (ASB) downstream to Mossy Lake and final discharge, via Coffee Creek, into the Ouachita River. I limited my tour to the main treatment system, starting at the City of Crossett Lagoon (and ASB) and working backwards (upstream) into the headworks of the Complex.

The first part of the system that we visited was the City of Crossett [Municipal Wastewater] Lagoon. (See Photograph #11 & Aerial #6.) According to Ms. Johnson, GP treats Crossett's effluent under an agreement that includes a pre-treatment program for the few minor industries that use the City's system. When we arrived, I observed a well-maintained unit. The lagoon is totally enclosed within a levy system that includes a dike that divides the lagoon into roughly two halves and a series of "curtains" or baffles that route the water through the unit in a circuitous path designed to increase residence time. I observed numerous water fowl and lush vegetation. The lagoon contributes about one million gallons per day to GP's treatment system. The unit discharges into the system just prior to the ASB.

After the inspection, I spoke with Mr. Jeffrey Harrison, wastewater engineer for the City of Crossett, to obtain additional information about the City of Crossett Lagoon and the arrangements between the city and GP. Mr. Harrison stated that the lagoon is a facultative biological treatment unit. It has a 42-day retention time. The City of Crossett provides no other form of treatment for its wastewater. Mr. Harrison stated that the city wastewater system consists of underground, enclosed concrete, conveyances. The first discharge to land is at the Lagoon. The City does sampling for specified parameters at the discharge point. Mr. Harrison stated that there were 6 to 8 small industries that discharged to the city's system. The industries are subject to pre-treatment standards that are equivalent to the CWA standards and they are memorialized in City Ordinance No. 2002-1. GP's water permit has a section that also speaks to the arrangement between the City of Crossett and GP. (These documents can be reviewed in Appendix B.)

The next area visited was the ASB. (See Photograph #12-14 & Aerial #4.) This unit is the major final treatment step in the overall wastewater treatment process. The 265 acre unit has a 534 million gallon storage capacity and a 48.5 million gallon per day discharge capacity. Water entering the ASB is supplemented with nitrogen, phosphorous, and bacteria. The unit contains 78, 50-horsepower aerators to enhance the biological degradation of organic compounds in the water.

We arrived at the Ashley [County] 11 Road wooden bridge, near the discharge point. Entrances to both ends of the bridge have been severed by the county because of potential safety concerns. Water in the conveyance appeared foamy. We moved a few hundred feet upstream, closer to the actual discharge point, at a footbridge where I took Photographs #13-14. Again the water had a foamy appearance and was tan in color. Mr. Cutbirth stated that the foamy appearance is due to the heavy aeration produced by the ASB's aerators and that the tan color is due to tannin, a byproduct of the lignin degradation. There was a noticeable, but not overpowering odor in this area that was reminiscent of the smell produced by a toy cap gun. I did not observe any stressed vegetation.

We moved upstream to the Surge Basin. (See Photographs #15-16 & Aerial #5.) This unit provides extra capacity during times of increased flow, such as during a storm event when runoff from plant process areas might overwhelm the system. Discharge from the Surge Basin to the ASB is shown in Photograph #14. GP can adjust the pH at this point to optimize the system, if necessary (note small diameter pipe entering from left bank near the discharge). Ms. Johnson explained that two concrete channels traverse the length of the unit; surge is absorbed laterally from the channels.

Sediment in and around the unit was dark grey in color. Ms. Johnson explained the color is due to ash that does not settle out in the West or East [Ash] Settling Ponds. I also observed grass growing on non-flooded areas of the Basin with a few areas that were brown or yellow in color. Water discharging from the unit was foaming in the conveyance to the ASB. Vegetation along, and in, the conveyance did not appear stressed.

We moved further upstream to the Settling Basins. (See Photographs #17-18 & Aerial #7.) This set of units provides settling and deposition for the light ash entrained in the P3 Sewer (see also Photographs #24-26). Two units, the West and the East, alternate operations. While one unit is in service the other unit is taken out of service in order to dredge the ash from the unit. Once the unit has been dredged, it is placed back into service and the other unit is taken out of service for dredging. Dredged ash is currently being place in an area known as the "Reclamation Area" (see Photograph #19 & Aerial #8).

When we arrived, the East Settling Basin was offline for dredging. The unit was dry and I observed grass growing on the slopes of areas that had not been excavated. The West Settling Basin was in use and contained water. Grass was growing up to the edge of the banks. Mr. Cutbirth stated that the basins generated about 100-120 tons of ash per day; that 4% of the weight of wood fuel ends up as ash.

We next drove through the Reclamation Area. (See Photograph #19 & Aerial #8.) According to Mr. Cutbirth, this was once a sludge disposal area. The rotting cellulose fibers caused nuisance odor problems and may have created a corrosive atmosphere in the immediate vicinity of the unit. Current operations are designed to correct the previous problems and reclaim the area. We did not drive around the entire unit. In the area in which we drove, I observed mainly ash deposition interspersed with grasses and scrub brush type vegetation.

We followed a dirt road which parallels the South Stormwater Conveyance. (See Photographs #20-21 & Aerials #10-13.) The Stormwater conveyances (both North and South) transport stormwater runoff from non-process areas of the Complex to Mossy Lake. The conveyances bypass the wastewater treatment system. [Note: Stormwater runoff from process areas of the complex are routed into the wastewater treatment system.] Most of the vegetation along the banks of the conveyance was lush. However, there were noticeable dead saplings. Mr. Cutbirth stated that GP actively inhibits tree growth in the conveyances in order to maintain unrestricted flow.

We arrived at the Primary Clarifier and Sludge Filter Press. (See Photograph #22 & Aerials #9-10. I did not photograph the Clarifier.) The Clarifier removes particulates, mainly fiber, from the combined P1/P2 Sewer streams. Treated water is discharged into the open P3 Sewer adjacent to the east side of the Clarifier. The Clarifier is rimmed on the north to east circumference by a stormwater overflow ditch (see Aerial). The ditch carries overflow from P1/P2 directly into P3 (bypassing the Clarifier) during heavy rain events.

Sludge removed from the clarifier is dewatered in a filter press, with the filtrate returned to the sewer. Mr. Cutbirth obtained a sample of the sludge for me to examine. The material had only a slight bit of dampness and had the appearance of blown-in cellulose-type attic insulation. The material was grey and had no detectable odor. GP generates about 50 tons of dried sludge per day. The material is disposed at the North Landfill.

We drove around the northwest side of the Clarifier in order to view the emergence of the P1 and P3 sewers from their respective underground pipes. (See Photographs #23-28 & Aerials #10-11.) The P1 Sewer (actually P1 and P2 combined) was on the north and the P3 Sewer was on the south. (P1 is captured in Photographs #23(a), 27, & 28. P3 is captured in Photographs #24, 25, & 26.) The P3 Sewer carries entrained light ash from the plant boilers. The material can be clearly seen in Photograph #25. The ash settles out in the Settling Basins. (P3 bypasses the Clarifier.) I did not observe any stressed vegetation along the P3 Sewer and there were numerous old-growth trees.

The wastewater in P1 presents a somewhat milky tan appearance and carries entrained fiber. Fiber is removed in the Primary Clarifier. Fiber dredged from the conveyance was piled along the south bank of the P1 conveyance (see Photograph #23(a)). I observed some discoloration of the concrete pipe from which P1 discharges and possible scaling. Vegetation along the conveyance was lush and did not appear stressed.

From this point upstream to a location just east of Hancock Road (west boundary of plant), the sewers run through underground piping. (See Photographs #50-52 & Aerials #13-14.) The sewers are open on the west side of the plant, and P2 joins P1 at that point. (This will be discussed in subsequent paragraphs.) According to Mr. Cutbirth, GP has plans to extend the underground piping of both sewers from this point – approximately another 800-1000 feet – to the Clarifier and Settling Basins.

At this point, we broke for lunch, resuming the tour of the plant-site in the afternoon.

The first area visited at the production plant was the U-Drain discharge (bleach plant alkaline discharge) and the confluence with the Fine Paper Mill discharge. [Note: Ms. Johnson stated that the discharge was from the U-drain; Mr. Cutbirth stated that the material was the alkaline discharge of the bleach plant.] (See Photographs #29-32 & Aerials #15-16.) A sampling station is also located here. The discharges emerge from underground concrete pipes. Water from the U-Drain was relatively clear but with a tan discoloration. Water from the Fine Paper Mill was translucent white. Mr. Cutbirth explained that the white color was due to entrained (bleached) fiber lost from production process. These two discharges are part of the P1 Sewer. The combined conveyance was earthen with grassy sloped banks. Just south of this point, P1 makes a sharp bend to the west, and continues as an open sewer, paralleling P3, through the southern third of the Pulp & Paper Mill, clearly visible in the aerials.

Downstream from this area are two other discharges into the system: the Acid Sewer (from the bleach plant) into P3; and Main 2 (from Cow Pen, Board Mill, & N/S Broke Chests) into P1. (See Aerial #16.) We did not visit these areas. According to Mr. Cutbirth, the Acid

Sewer is entirely enclosed within a fiberglass pipe until it reaches P3. It enters P3 through a concrete, screened, mixing box. These segments of both P1 and P3 are earthen as described in the preceding paragraph. According to the Stormwater Drainage Map, these sections of P1and P3 are scheduled to be closed in – underground piping – in the near future. Currently, the two sewers go back into underground pipes just west of the Tissue Warehouses, but emerge again near the west boundary of the facility (see following paragraphs).

We moved further up into the production areas of the plant and observed the "Cow Pen"/Board Mill Discharge. (See Photograph #33.) The discharge is to a short section of concrete lined ditch. The water was milky white in color.

We then drove to an open section of the P2 Sewer near the south side of the Woodyard (wood chip piles). (See Photograph #34 & Aerial #18.) This is an earthen ditch, although the north bank is covered with grass. Mr. Curbirth stated that this section was the combined discharge from the GP2/GP3 Washers and COMP 1. He further stated that the area would be closed in – underground piping – in the near future.

We arrived at the Liquor Recovery area and Ms. Johnson pointed out the secondary containment, sloped drainage, and sumps designed to capture and return to the process any potential spills or leaks of black liquor. The material is valuable to the company and GP has designed the system to ensure recovery. The system is also designed to keep the material out of the P2 Sewer. (See Photographs #35-38.) I observed several sumps covered with metal grating and multiple pipes and valves in this area. I observed a small area of stained concrete beneath a black-stained piping elbow. There was no free liquid present. (See Photograph #37.)

A small portion of the "GP3" Sewer (GP2/GP3 Washer) discharge can also be viewed in this area. (Photograph #35.) The discharge appeared to be enclosed by a concrete structure.

I also observed another small area of stained concrete and a small amount of black liquid around the base of one of the black liquor storage tanks – #28-2346. (See Photographs #36 & 38.) Mr. Cutbirth contacted Mr. Glenn McRee, Pulp Mill Production Manager, who arrived shortly to discuss the apparent leak with me. Mr. McRee stated that the tank appeared to have stopped leaking, but that it had leaked in the past, and that it was scheduled to be taken out of service for inspection and repair during the facility "Outage" (Turnaround) in May. Mr. Cutbirth later stated that the leak was obviously very small and may have plugged itself.

We dropped Ms. Johnson off at the U-Drain area so that she could attend a meeting and then resumed the tour at the Slaker Grits storage area. (See Photographs #39-40.) Both dregs and slaker grits are washed to recover chemicals. The dregs are sewered. The grits are dewatered and discharged to piles in this area, for storage, prior to disposal at the North Landfill. Mr. Cutbirth collected samples of the material for me to examine. The materials appeared dry. However, steam condensate from a pipe about 50 feet away from the storage area, was flowing towards and into the two piles and re-wetting the bottoms of the piles. Mr. Cutbirth stated that he would report the problem. Near the grits was another pile of white granular solid that Mr. Cutbirth believed to be lime.

We next drove around the lime kiln and lime mud processing areas. I asked Mr. Cutbirth about management of potential lime mud spills or leaks. He stated that the material was a valuable product, like black liquor, and that any leaks or spills would be quickly recovered and returned to the process. Mr. Cutbirth stated that the facility had to be extremely diligent about keeping any potential lime mud spills out of the sewer system, since it would set up and clog the system. I did not observe any spills, leaks, or wet areas in this part of the plant. I did observe multiple secondary containment structures and sumps.

Mr. Cutbirth stated that GP fully supports the Best Management Practice (BMP) of reporting issues before they become problems. Employees are encouraged, without any fear of reprisal, to report anything they believe could compromise safety, productivity, or increase costs to the company. He stated that there is a tiered structure or hierarchy for action: Observation; Substandard Condition; Near Miss. Since this BMP was instituted, the plant has seen orders of magnitude decreases in safety issues. Mr. Cutbirth intimated that this was one of the reasons for the good housekeeping observed throughout the plant.

We next moved to the Black Liquor Storage Basin. (See Photographs #41-48 & Aerial #19.) Mr. Eric Snellgrove, Utilities & Pulp Manager, and Mr. Dave Harris, COMP 1 Supervisor, joined us at the Basin to help answer questions I had about the structure. This unit appears to be constructed of concrete, although the details of construction are uncertain. (No engineering diagrams were available for review.) It has a synthetic, HDPE, 80 mil liner. It is embedded in a large mound of earth and is underlain by clay; however, the hydraulic conductivity of the clay layer is unknown. It is basically a large bowl with a conical bottom. The unit was once a log storage pond and there is a "pedestal" in the center of the structure where the gantry (or crane) used to be anchored. The top of the ladder on the side of the pedestal marks the 41-foot depth to the bottom of the unit. It has a capacity of 30 million gallons. The unit has a ground water monitoring system composed of three ground water monitoring wells set between 50-60 feet below the ground surface, which is the first water-bearing zone. (Analytical data are provided in the Record Review section.)

A set of pumps is perched on the end of a floating catwalk/gangway and provides for withdraw of the black liquor back to recovery operations via 4- and 6-inch lines. The 10-inch input line is located to the west of the gangway. A smaller 2- to 3-inch PVC line on the west rim of the unit (see Photograph #47) discharges white liquor pumped from sumps that service the adjacent White Liquor Storage Tank shown in Photograph #49. A black hose w/coupling was draped over the top third of the southwest bank (see Photograph #42(a)). Mr. Cutbirth stated that the hose is used to make "liquor swaps" (transfers of black liquor to other pulp/paper mills), although this activity has not taken place for some time, according to Ms. Ross.

According to Mr. Snellgrove, the unit provides GP with what amounts to a "wide spot in the line", as far as processing black liquor is concerned. It essentially functions as a surge basin and provides an economical means of storing a very large volume of material. Mr. Cutbirth and Mr. Snellgrove both stated that the plant goes to great lengths to recover black liquor because of the great cost of procuring new chemicals if black liquor was not available.

I walked completely around the top of the unit. I did not observe any signs of leaks, discoloration, or stressed vegetation. I observed the three monitoring wells at the base of the unit located at southwest, north, and southeast positions. The liner showed numerous signs of repair – from relatively small (couple inches) to rather large (several feet) patches – but I did not observe any unrepaired tears. The black liquor had a thick reddish-brown floating layer of "scum", which Mr. Cutbirth described as "soap". It is basically composed of fatty acids produced from the digestion process and is also known as Tall Oil. Some pulp and paper mills separate this material from the black liquor and process it into other materials. However, GP burns the material along with the black liquor in the Recovery Boiler. (It adds significant BTU value.)

We next visited the western boundary of the plant in order to view the P1 and P3 sewers as they exit the facility. (See Photographs #50-52 & Aerials #13-14.) The two sewers emerge from underneath a large parking area, continue under the dirt road and railroad trestle on the western boundary, and then go back underground, just east of Hancock Road. P2 joins P1 from the northeast just west of the railroad trestle (see Photograph #52(a)). Stormwater from process areas in the northwest part of the plant enters the combined P1/P2 sewer just before it goes back underground. The conveyances are entirely earthen. The two wastewater streams have similar appearances to that described where they emerge near the clarifier: P1 has a milky tan color, whereas P3 appears darkly clear (because of the entrained ash). A sample station is also located at this point. Vegetation along the P1/P2 conveyance did not appear to be stressed – shrubbery and trees growing down to the water's edge.

The last area visited was the [Heavy] Ash Settling Pond. (See Photographs #53-54 & Aerial #17.) This unit is situated at the headworks of the P3 Sewer. It collects heavy ash which settles out immediately (compared to the lighter ash which remains entrained in the P3 wastewater). The unit is continually dredged and the spoils are sent to the North Landfill for disposal.

As shown in the aerial, there are at least three other earthen "tributaries" of the P3 Sewer in this area: the western segment servicing the 9A and 10A Boilers; the Plywood Mill effluent and the Chemical Plant effluent, both from the east. The Chemical Plant effluent originates from the collection of wastewater in the Chemical Pond. (See the discussions of the Chemical Plant in the Operations/Processes, Solid Waste Management, and Records Review sections.) All of these various segments combine to form the headwaters of the P3 Sewer which continues downstream towards the west as described in previous paragraphs and shown in Aerial #15.

This completed the site tour. The entire plant was very clean. I did not observe any major leaks or spills. We returned to the conference room, wrapped up questions I had from the site tour, and went over plans for the next day. I departed the facility around 6 PM.

Records Review

On Thursday morning, I provided Mr. Cutbirth with a list of outstanding items, and I spent most of the day reviewing documentation related to my inspection goals. GP-provided documents are available for review in Appendix B. (Those documents that GP declared CBI are not available for public review.) I reviewed some of the documents that I received, after the inspection, during the drafting of this report, including those sent to me by GP Chemical and the City of Crossett.

North Landfill

The first documents I reviewed were weigh tickets for the North Landfill. The tickets resemble receipts that you would get at a department store. A one-month stack of tickets is 1.5-2 inches thick. This unit receives over 20 loads per day. Most loads are labeled "tissue" and average 1-2 tons/each. The fill also receives ash. Some tickets are labeled "landfill misc". Mr. Freeman stated that this was common trash. I did not see any tickets for slaker grits for the month I reviewed – February 2012. Mr. Freeman stated that grits disposal was periodic and a month could pass without receipt of that material.

On February 8, 2012, the North Landfill received two loads (9,680 & 7,088 lbs/each) of "black liquor spill". Mr. Freeman stated that the material was actually sawdust and woodchips that were used to clean up the spill and that no free liquids were in the material. When asked about analytical data for the material, Mr. Cutbirth stated that the hazardous waste determination for this material was made by KOP. The ground water monitoring report for the Black Liquor Lagoon states that arsenic and chromium can be markers for black liquor contamination of ground water. If arsenic and chromium can be constituents in this material, then GP should have tested the cleanup material by TCLP for RCRA metals as a confirmatory precaution.

After the inspection Mr. Cutbirth provided me with TCLP analytical results for a sample of "50% Black Liquor" collected on July 6, 2012. The material was analyzed for RCRA metals. All the metals concentrations except barium were below the minimum detection limits of the method(s). The barium concentration was 300 times lower than the regulatory limit. Apparently, arsenic and chromium are not present in GP's black liquor.

I was provided with the January 2012 Hazardous Waste & Unauthorized Waste Exclusion Plan for the North Landfill. [I reviewed this document after the inspection.] This document contains a list of prohibited materials and describes the procedures to be used for mandatory random inspections of incoming loads. Mr. Freeman and Ms. Ross stated that the security checkpoint at the gate to this facility is very diligent about checking each load to see that they meet the requirements for acceptance. The document also specifies mandatory training for GP personnel involved in waste management. The document contains a contingency plan and there is a records management section with a sample [random] incoming load inspection form. The waste identification and screening procedures section states that hazardous waste determinations will be conducted by GP personnel who are trained in this regard and that plant-wide GP personnel “are trained to call the Environmental Department if any non-routine wastes are generated so that proper disposal can be determined according to state and federal regulations and the landfill permit.”

The North Landfill has a ground water monitoring system. I was provided with the Second Half 2011 Ground Water Monitoring Report. [I reviewed this document after the inspection.] The system includes 7 monitoring wells. Depth to water ranges from 11-31 feet. The overall ground water flow for this reporting event was to the south-southeast, which is consistent with past reports. The most upgradient well (MW-2N) is on the northwest corner of the unit. The most downgradient well (MW-4) is on the southeast corner of the unit. The system was first sampled in 1998. RCRA parameters which are monitored include: arsenic, barium, chromium (total), lead, pH, and benzene. The results are subjected to statistical analyses in order to reveal differences between wells and over time.

The pH was measured in the field and ranged from 3.9 to 6.7 S.U. (MW-2N = 6.5; MW-4 = 6.5). Neither benzene nor lead were detected in any well. Arsenic was the only metal that exceeded the primary drinking water standard – Maximum Contaminant Level (MCL) – and it was elevated in MW-2N as well. The report indicates that arsenic may be naturally higher than the MCL in this locale, and that the concentrations have not changed significantly over time. Statistically significant increases were seen in sulfate at three wells that are upgradient from the active portion of the unit. Again, the report indicates that this may be attributable to naturally occurring elevated levels. None of the RCRA constituents were present at concentrations above regulatory limits

Previous sampling events have included additional RCRA (and non-RCRA) constituents, including chlorinated organic compounds (chloroform, carbon tetrachloride, etc.) that would be of interest because of the bleach plant operations. A comprehensive listing is provided in the tables of historical sampling events in the monitoring report. None of the organic constituents were found in concentrations that would be of RCRA regulatory concern. Concentrations of most constituents were below the minimum detection limits (sub-microgram per Liter) of the analytical methods.

The Ground Water Monitoring Report also lists analytical data for leachate. The pH of the leachate was 8.1 S.U.. Benzene was not detected. RCRA metals detected were present in concentrations that are hundreds of times lower than the RCRA regulatory limits.

East Landfill

I reviewed weigh tickets for the East Landfill. Sixteen tickets for February 1, 2012 listed "pole yard waste" (10 to 14 tons per load). Mr. Freeman stated that this material was bark, which would normally be used as wood fuel, but that had been contaminated with soil and/or rocks and was no longer suitable as fuel. During late January and into early February of 2012, the unit received 14 loads of "dirt" (7 to 18 tons per load). Also, during January and February, the unit received 3 loads of "wet yard waste" (20 tons per load), 16 loads of concrete (8 to 13 tons per load), and 13 loads of "cull wood" (4 to 6 tons per load). These materials originated at any one of three yards: wet yard, pole yard, or the woodyard (chip piles).

The East Landfill has a Hazardous Waste & Unauthorized Waste Exclusion Plan which is similar, in many respects, to the Plan for the North Yard. [I reviewed this document after the inspection.] It lists materials that can be accepted and prohibited items. It provides inspection procedures and lists training requirements for hazardous waste recognition. There is also a contingency section that describes the measures that must be taken if an unauthorized waste is interred. Leachate from the East Landfill is not analyzed.

Analytical Data/Hazardous Waste Determinations (all data are provided in Appendix B)

I reviewed the daily "Sewer Reports" for the month of January 2012. These reports list various process parameters that are measured at the 14 internal sampling stations. (See also discussion in Secondary Materials Management section on these sampling stations.) The reports list fiber loss, wastewater flow rates, total organic carbon (TOC), conductivity, and pH. Mr. Cutbirth declared the reports CBI. The main RCRA parameter of interest is pH, and Mr. Cutbirth told me that pH data would not be considered CBI.

The pH never exceeded 12.5 Standard Units (S.U.), the regulatory cutoff for RCRA, at any of the stations. The highest readings were observed for the Cow Pen (~10 S.U.), GP III (~10 S.U.), and COMP 1 (~10.5-11.0 S.U.). The highest reading I observed was 12.2 S.U., for COMP 1, on January 12, 2012. Readings for P2, overall, were about 10.5 S.U.. On January 12, 2012, P2 was at 11.7 S.U.. The pH readings at the other stations were usually between 7 and 8 S.U.. The pH for P1 was around 8 S.U. and for P3, around 7 S.U.. There were no pH data for the three internal CWA outfalls. Mr. Cutbirth stated that previous experience showed that the pH was always between 3.5-4.0 S.U., at these locations.

Ms. Johnson provided me with copies of analytical data for chloroform and chlorinated phenolic compounds, including trichlorophenol (both the 2,4,5- and the 2,4,6- isomers) and pentachlorophenol – all RCRA constituents. Ms. Johnson also gave me a copy of a NCASI technical bulletin on chloroform.

Ms. Johnson provided two separate reports for chloroform. One report, a spreadsheet, lists the analytical results for each bleach line (each line represents a separate internal outfall), after the laboratory has electronically composited individual results from each stage of the bleaching operations. [Note: There are three bleach lines: Line 1A (Hardwood) – Internal Outfall 101; Line 1B (Hardwood) – Internal Outfall 102; Line 2 (Softwood) – Internal Outfall 103.] A daily result, listed for 6 different months, were all between 5 and 35 micrograms per Liter. The RCRA regulatory limit for chloroform is 6,000 micrograms per Liter. The second report lists the results at each bleaching stage, prior to the laboratory compositing the results for a final concentration. Results again ranged from 5 to 35 micrograms per Liter. (The samples were taken from Line 1A, Line 1B, and Line 2 on November 6, 2011.) All samples were analyzed by EPA Standard Methods for the Examination of Water & Wastewater Method 624 – the method specified in the CWA permit.

The analytical report for the chlorinated phenolic compounds listed the results for all constituents at below the minimum detection limits (MDL). For pentachlorophenol, the MDL was 0.25 micrograms per Liter. For 2,4,5-trichlorophenol, the MDL was 0.13 micrograms per Liter. For 2,4,6-trichlorophenol, the MDL was 0.15 micrograms per Liter. The RCRA regulatory limit for these constituents is 100,000, 400,000, and 2,000 micrograms per Liter, respectively. (The samples were taken from Line 1A, Line 1B, and Line 2 on January 8, 2012.) All samples were analyzed by EPA Standard Methods for the Examination of Water & Wastewater Method 1653.

[Note: According to Mr. Cutbirth, pentachlorophenol and trichlorophenols, were once used as paper machine biocides; however, these chemicals were phased out over 20 years ago – GP does not use these chemicals in their paper operations.]

After the inspection, I called Mr. Cutbirth to discuss other sampling and analytical data that may have been collected, but not provided to me. Mr. Cutbirth was joined on the call by Mr. Mayes Starke, an internal wastewater consultant, who informed me that GP had just recently conducted sampling for additional VOAs as part of a CAA Title V NCASI open-ditch modeling project. GP pulled samples from 10 locations: Outfall 001; E1 discharge from the Surge Basin; the open P1/P2 combined process sewer upstream of the Clarifier; the P3 sewer upstream of the Clarifier and East/West [Ash] Settling Basins; P3 downstream of the Chemical Plant discharge; P1 downstream of Fine Paper; P1 after #2 Main; P3 after the Acid Bleach Plant mixing box; the P3 and P1 flumes, both at the western boundary of the plant. Mr. Cutbirth marked these locations on a new Stormwater Drainage Map (CBI). RCRA VOAs for which the samples were analyzed included: benzene, carbon tetrachloride, m-cresol, p-cresol, and chloroform. The only constituent detected was chloroform. It was present in all samples except Outfall 001. Concentrations ranged from 11 to 43 micrograms per liter. The RCRA regulatory limit for chloroform is 6,000 micrograms per Liter.

Mr. Freeman provided me with analytical data for samples of composite heavy ash from the Ash Pond, Primary Clarifier sludge, and dredge spoils (light ash) from the Settling Basins. The samples were analyzed by TCLP and SW-846 Method 6020 for metals. Metals concentrations in all of the samples were 100 times lower than the RCRA regulatory limits.

GP uses KOP for hazardous waste determinations on dregs and grits based on technical information available from NCASI. Ms. Ross stated that the dregs are normally sewered and settle out with the ash. Grits are washed, dewatered, and disposed at the North Landfill. Mr. Cutbirth stated that both materials are double-washed to retrieve the pulping chemicals, and as such, they should not exhibit any RCRA hazardous characteristic.

Mr. Freeman provided me with analytical data for the used oil that GP generates on site and for the material that is purchased as used oil fuel. Data for one of the used oil tickets provided to me lists arsenic at < 0.5 parts per million (ppm), cadmium at 0.04 ppm, chromium at 1 ppm, lead at 2 ppm, total halogens at 560 ppm, PCBs at <1 ppm, and flash point at >200ºF. Regulatory limits are 5 ppm, 2 ppm, 10 ppm, 100 ppm, 4,000 ppm, <2 ppm, and 100 ºF (minimum), respectively. Therefore, the used oil that GP purchases in on-specification.

I reviewed 9 used oil tickets for used oil generated on site. GP generates about 10,000 lbs of used oil each month. The material was always on-specification. Arsenic, cadmium, chromium, and lead were usually less than 1 ppm. Halogen concentrations were generally lower than 75 ppm. PCBs were less than 1 ppm. The highest lead reading I observed was 6 ppm.

I asked to see the most recent hazardous waste notification form sent to ADEQ. GP must check the box that indicates they are the first to claim used oil meets fuel specifications – Used Oil Marketer. They had neglected to check the box. Mr. Cutbirth stated that they had always checked the box in previous years and that this was an oversight. Mr. Freeman immediately contacted ADEQ and revised the form.

Material Safety Data Sheets (MSDS)

Mr. Cutbirth provided me with MSDSs for lime mud, white liquor, green liquor, weak black liquor, and [concentrated] black liquor. There may be rare opportunities for these materials to end up in land units through spills, leaks, or process upsets. I wanted to assess the applicability of RCRA to these products in the event land disposal should occur. (However, see caveat for using MSDSs at the end of this sub-section.)

Lime mud is a slurry of limestone (calcium carbonate) with smaller amounts of calcium hydroxide, kaolin (clay), sodium carbonate, and silica. The pH of the material is listed between 9 and 11 S.U.. This material would not be expected to exhibit a RCRA hazardous characteristic if disposed.

White liquor is an aqueous (40-60% water) mixture of sodium hydroxide, sodium carbonate, sodium sulfide, sodium chloride, and sodium sulfate. The material has a pH greater than 12.5 S.U. and has the potential to release hydrogen sulfide gas. This material would be a RCRA corrosive and potentially reactive characteristic hazardous waste if disposed.

Green liquor is similar in composition to white liquor; however, the ratio of the constituent concentrations is different. The pH is listed as greater than 12 S.U. and the material may have the potential to release hydrogen sulfide gas. This material could be a RCRA corrosive and potentially reactive characteristic hazardous waste if disposed.

Weak black liquor is an aqueous (60-80% water) mixture of sodium carbonate, sodium sulfate, sodium hydroxide, and sodium thiosulfate. The material would also contain lignin and degraded cellulose and hemi-cellulose. The material has a pH between 7 and 10 S.U.. It may have little potential to evolve hydrogen sulfide gas. Therefore, this material would probably not be a RCRA hazardous waste if disposed. [Note: Mr. Cutbirth provided me with a copy of the April 9, 2012 Pulp/Bleach Day Tester Report (CBI). The pH of GP's weak black liquor was 8.02 and 8.41 S.U. (from the hardwood and softwood lines, respectively).]

Concentrated black liquor is the evaporated form of weak black liquor. The composition is similar to weak black liquor except that the percentage of water would be reduced and the concentration of the constituents would be higher. In addition, this material could also contain sodium sulfide. The MSDS provided to me is not specific as to the evaporation stage. According to Mr. Cutbirth, the final evaporation stage produces a material that no longer contains free liquids, and it is burned in the Recovery Furnace. If the material still contained free liquids, it could have a pH between 11 and 14 S.U. There might be potential for the generation of hydrogen sulfide gas. This material could be a RCRA corrosive characteristic hazardous waste if disposed; unknown whether or not it would also be reactive.

[Note: Although MSDSs are a convenient and important source of chemical information, they are of somewhat limited use for making hazardous waste determinations. The sheets are required by law to report carcinogenic compounds present in concentrations above 0.1% and toxic compounds present in concentrations above 1%. Most RCRA constituents have regulatory limits well below these concentrations – parts per million (ppm) range (1% equals 10,000 ppm). Therefore, a material may contain RCRA constituents at or above regulatory limits, but this information would not be required to be listed on the MSDS.]

Weak Black Liquor Storage Basin

I reviewed the first Ground Water Report (July 2008), two additional analytical report summaries (November 7, 2011 and June 1, 2010), and three ground water monitoring sampling records (November 2, 2011, June 7, 2011, and May 19, 2010) for the [weak] Black Liquor Storage Basin. The three monitoring wells were set in April 2008. The report noted that there was no indication of stained soil in any of the cuttings from the bores. [Note: During this time a fourth boring was completed on the northern berm where a rip in the synthetic liner had been discovered (and repaired). There was no visual indication of a black liquor release in the cuttings from that bore.] Depth to ground water was 60 to 64 feet. Ground water flow was determined to be towards the south. Therefore, well BLP-2 would be upgradient, while BLP-1 and BLP-3 would be downgradient.

The pH of the wells ranged from 6.2 (BLP-1 and BLP-2) to 6.6 (BLP-3). Conductivity was 628 micro-Siemens per centimeter (µS/cm) for BLP-2, 892 µS/cm for BLP-1, and 988 µS/cm for BLP-3. Sodium concentrations were 79 mg/L for BLP-2, 110 mg/L for BLP-1, and 92 mg/L for BLP-3. Conductivity and sodium concentrations appear to trend higher in the downgradient wells compared to upgradient well BLP-2, although I did not run a statistical analysis on these data. (GP may want to want to explore the significance of this observation.) TOC concentrations were 1.0 mg/L for BLP-2, 5.7 mg/L for BLP-1, and 0.80 mg/L for BLP-3. Concentrations of the RCRA metals were all below regulatory limits and were also below the drinking water MCLs. (See Table 3 in the Report – Appendix B.)

The Report concluded that there did not appear to be any significant variations in ground water quality between the upgradient and downgradient wells. However, the Report did not reference the statistical analysis used to draw this conclusion. The Report further stated that ground water at other sites which had been impacted by black liquor usually tended toward alkaline pH, had conductivities above 1,000 µS/cm, TOC concentrations above 1,000 mg/L, arsenic concentrations in excess of 1.0 mg/L, and chromium concentrations up to 1.0 mg/L. The Report concluded that the water in the vicinity of the Black Liquor Storage Basin had not been impacted by releases of black liquor.

I reviewed the two analytical reports and the three sampling records in an attempt to assess trends over time. However, the analytical reports do not record pH or conductivity data and the sampling records do not report sodium or TOC – four important indicator parameters, besides arsenic and chromium. (The analytical reports record metals and TOC; the sampling records record pH and conductivity.) In order to make the analytical reports more useful, pH and conductivity should also be listed in the reports. [Note: Sulfate may also be a useful marker or indicator of release of black liquor. This anion does not strongly adsorb to clay and is relatively mobile in subsurface environments.]

Without conducting any statistical analyses, my observation of the four additional sets of data did not reveal any obvious trends with time. Metals concentrations were all still extremely low, at parts per billion. Sodium, TOC, conductivity, and pH were all at about the same level as first observed in 2008. [Note: Drought conditions in 2010/2011 resulted in lowering the water table to such an extent that BLP-3 had insufficient water for sampling for the November 2011 sampling events.] Conductivity actually dropped in all of the wells in June 2011 (range = 270-370 µS/cm). The pH dropped in the two sampled wells in November 2011 (range = 5.1-5.7 S.U.). This is the opposite trend that one would expect if black liquor were impacting these wells.

I asked Mr. Cutbirth to provide me with data/records that would document that GP recovers at least 75% of their stored weak black liquor in any calendar year. After discussing the issue, we decided that the simplest way to do this would be to compare the total amount of weak black liquor produced in a year to the total amount of weak black liquor recovered in the same time span. Mr. Snellgrove indicated that these data were readily available and/or could be calculated from the plant's data management system. Mr. Snellgrove provided us with a comparison of the total amount of weak black liquor feed from the pulp mill to the amounts reclaimed from the pond and fed to the evaporators for the period January 1, 2011 to January 1, 2012. The percent recovered equaled 93.82%, well above the 75% required to rebut speculative accumulation.

<u>GP Chemicals</u>

After the inspection, Ms. Matthews and Mr. Hudson provided me with several sets of documents: block flow diagrams of the processes and sewerage, spreadsheets which summarize hazardous waste determinations for the various waste streams generated, analytical data for API underflow and vacuum pit water from CTO processing, and several months of truck washing records. Cover letters to these documents also clarified or expounded on points made by the GP Chemical representatives during our inspection interview.

GP Chemical processes either utilize products or produce secondary materials that may be of potential RCRA concern. Constituents that can be found in the GP Chemical Plant effluent include: methanol, formaldehyde, phenol, benzene, toluene, methyl ethyl ketone, acetaldehyde, cyclopentanone, cresols, chromium, and ammonia. RCRA constituents of concern that were detected in vacuum pit water included chromium and cresols. Concentrations were below regulatory limits. The pH was 7.9 S.U.. The RCRA constituent of concern most often detected in the API Separator underflow [water] was benzene. Concentrations were below regulatory limits. Other constituents detected, included methanol, formaldehyde, acetaldehyde, and toluene. No pH measurements were listed for the API underflow.

The spreadsheets outline hazardous waste determination logic for 20 separately listed waste streams. The color-coded charts list the eight categories of RCRA hazardous waste classes (ignitable, corrosive, reactive, toxic, and F-, K-, P-, and U-listed wastes) and the determination that has been made for each waste stream, as well as the logic used to make that determination, including KOP or testing. The spreadsheets briefly document how each waste stream is generated, if/how it is treated, where it is stored or managed, and how it is disposed.

I reviewed approximately 220 truck wash records for the period February 1 through April 30, 2012. The trailers had carried a variety of things, but mainly CTO (93 trailers), resins, and potassium hydroxide; less frequently, formaldehyde, methanol, and "dry spray". Most of the trailers (136) received a "caustic wash". Mr. Hudson explained (in an email to me) the caustic wash process: "The truck wash operates such that 3 gallons of caustic is mixed with approximately 75 gallons of water in a mixing tank. This mixture is used to wash out the truck and the wash is then immediately followed with an automatic cold water rinse. The large amount of water used in this operation effectively neutralizes the caustic. All of this wash and rinse material enters the trench system, which discharges to Containment Area #1."

City of Crossett

After the inspection, I spoke with Mr. Jeffrey Harrison, wastewater engineer for the City of Crossett, to obtain additional information about the City of Crossett Lagoon and the arrangements between the city and GP. (Highlights of that discussion are chronicled in the Lagoon Visit of the Site Tour section.) Mr. Harrison provided me with a copy of City Ordinance No. 2002-1 and a list of industries served by the municipal wastewater system. City Ordinance No. 2002-1 details the requirements for any industry which may wish to discharge to the city's municipal system. It is supposed to be equivalent to the EPA CWA pre-treatment program. Industrial customers are required to "pre-treat" their wastewater in order to comply with the discharge limitations mandated by the ordinance. The goal is to prevent the discharge of any substance that could damage the treatment system or that could pass through the system inadequately treated and end up in the receiving waters. The ordinance contains lists of prohibited practices and lists of pollutants that must not be discharged. It lists the requirements for obtaining a permit to discharge to the system and the conditions under which a permit can be revoked. There are compliance monitoring and reporting requirements, and enforcement remedies for noncompliance. Mr. Harrison manages the pretreatment program.

Exit Briefing

On Thursday at 3:30 PM, we moved to the conference room in the Administration Building so that I could provide an exit briefing to GP management and staff. The group consisted of the same participants who were present at the in-briefing, except for Mr. Rupple, who had to return to Little Rock prior to the briefing. Also, tied into the briefing by conference telephone, were the following GP Headquarters managers from Atlanta, Georgia:

Michael Curtis, Technical Manager, North American Consumer Products
Scott Bailey, Environmental Manager, North American Consumer Products

I reviewed the purpose and scope of the inspection. I provided a summary of the inspection activities and my observations. I noted that I did not see any significant areas of stressed vegetation along the wastewater treatment system conveyances or around the surface impoundments. I noted that I did not observe any serious leaks or spills in the plant area – only the minor (and apparently plugged) leak at the black liquor tank. I noted that it appeared that controls were in place to capture and recover any potential spills of black liquor (and lime mud), should they occur. I generally described the type of documents that I reviewed and noted that I did not observe any glaring deficiencies – only one minor discrepancy on the used oil management notification.

I noted that although I did not observe any significant areas of concern during the inspection, it was possible that I might discover issues once I started to draft the inspection report. I gave an estimated date when GP might expect to receive a final CEI Report and recommended that GP respond in writing to any inconsistencies or errors found in the report. I explained that the report would be readily available to the public through the Freedom of Information Act process, but that CBI would not be publically available and would be filed separately from the report, in a special file room at the EPA office in Dallas. I thanked the group for their hospitality and full cooperation, and then offered to answer questions.

There was some discussion on community/Environmental Justice issues. I provided the group with observations I had made when I reviewed data from EJ View, and informed them that they could access the same information at the Region 6 public website.

After the exit briefing, we returned to the Technical Building to finish document copying and to tie up final loose ends. I departed the facility at about 5:30 PM.

Mr. Cutbirth and his staff (Ms. Johnson, Ms. Ross, and Mr. Freeman) were very cooperative, knowledgeable, and professional. It was a pleasure to meet and work with them, during the inspection. All of the plant operators were always immediately available and forthcoming with needed information. Ms. Dickinson's welcoming and fully supportive tone was very much appreciated.

Areas of Concern/Recommendations

I did not observe any major areas of concern, either while I was at the facility, or during the drafting of this report. The following bullets are provided as best management practices.

- Caution must be used when relying on MSDSs for making hazardous waste determinations.

- Although the concentrations of chlorinated organics are very low in the bleach plant wastewater streams, GP may want to consider sampling the primary clarifier sludge to confirm that these compounds do not adsorb to, or concentrate in, the fiber sludge.

- GP should have available for review, pH data for the bleach plant discharges to land units.

- Ground water monitoring reporting for the Black Liquor Lagoon could be more inclusive; *i.e.*, data for all of the constituents that are monitored should be reported on the same document/record for each well.

- Although the absolute concentrations for indicator species in ground water monitored at the Black Liquor Lagoon are not high enough to be presumptive of subsurface contamination, conductivity and sodium concentrations appear to trend higher in the downgradient wells compared to the upgradient well BLP-2. GP may want to want to explore the significance of this observation.

- A tabulated list of analytical data for each discharge to a land unit, would provide a clear and concise method of quickly determining compliance with the RCRA land disposal restrictions; *e.g.*, compile data, which are already available in multiple sources and documents, into single data sets for each discharge point. This should include the discharge into P3 from GP Chemical and the Plywood Plant.

Documents Received from Georgia-Pacific

- Business Cards - Facility Representatives
- Sewer Monitoring – Print-Screen Schematic
- Site Stormwater Drainage Map – **CBI**
- Sewer Reports: 1/3, 1/12, 4/9, 4/11 of 2012 – **CBI**
- NCASI Chloroform Technical Paper
- Analytical Report Chloroform – 11/16/11
- Chloroform Internal Outfall Analysis Spreadsheet
- Analytical Report Chlorinated Phenols – 1/24/12
- CAA Title V VOA Monitoring
- New Site Stormwater Drainage Map – **CBI**
- TCLP Ash, Sludge, Spoils – 3/20/09
- TCLP 50% Black Liquor
- MSDS: Lime Mud; White; Green; Black; Weak Black
- Day Report – pH Weak Black Liquor – 4/9/12 – **CBI**
- Analytical – Used Oil Generated On Site – 2/27/12
- Analytical Used Oil Purchased for Fuel – 2/2/12
- North Landfill GW monitoring Report – 2nd Half 2011
- East Landfill HW Exclusion Plan – 2012
- North Landfill HW Exclusion Plan – 2012
- Analytical Black Liquor GW Monitoring Report Plus Additional Excerpted Analytical Data
- Calculations – Annual Recovery Weak Black Liquor

From GP Chemicals, LLC

- Resin Plant & Tall Oil Plant Wastewater Block Flow
- Crossett TOFRAC Process Block Flow
- Crossett Resin Process Block Flow
- Correspondence – April 13, 2012
- Vacuum Pit Water Analytical – 3/23/10
- API Water Analytical – 4/8, 4/17, 4/24 of 2008
- HW Determination Spreadsheet
- Photo – Corner Wall Red Water Lagoon
- Correspondence – May 11, 2012
- GP Chemical Plot Plan
- Truck Wash Records & Key to Terms

Documents Received from the City of Crossett

- Ordinance No. 2002-1
- List of Industries that Discharge to Crossett System

Supporting Documents

- ADEQ RCRA CEI – May 28, 2009
- Excerpts – Kraft Pulp Mill Compliance Guide
- Excerpts – Profile of Pulp & Paper Industry
- GP Process Description – Excerpt CWA Permit (2)
- GP CAA Excerpts – Unit by Unit Specific Conditions
- GP Wastewater Treatment Schematic
- GP CWA Permit Excerpts
- GP CWA CAA RCRA Constituent Crosswalk
- TRI RCRA Crosswalk
- North Landfill Solid Waste Permit
- East Landfill Solid Waste Permit

APPENDIX - A

Aerial Photographs

APPENDIX - B

Documents Provided by GP

APPENDIX - C

EPA PHOTOGRAPHS

APPENDIX - D

SUPPORTING DOCUMENTS

Documents Obtained

From

Georgia-Pacific Chemicals

Documents Obtained

From

The City of Crossett